



**ENGINEERING OPERATIONS COMMITTEE  
MEETING MINUTES  
DECEMBER 8, 2006 – 9:00 A.M.  
MULTI-MODAL CONFERENCE ROOM**

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<i>Present:</i>	L. Tibbits	J. Friend	J. Polasek
	B. J. O'Brien	J. W. Reincke	M. Van Port Fleet
	J. D. Culp	T. Anderson	C. Roberts
	T. Fudaly	C. Bleech	E. Burns
<i>Guests:</i>	M. Bott	J. Morena	J. Grossklaus
	P. Corlett	K. Kennedy	D. Morena (FHWA)

**OLD BUSINESS**

**1. Approval of the Minutes of the November 2, 2006, Meeting – L. Tibbits**

The November 2, 2006, meeting minutes are approved.

**2. Pavement Markings on Shoulder Rumbles – “Rumble Stripes” – J. Morena and M. Bott**

Most pavement markings do not reflect well when covered with water. With the discontinuation of raised pavement markers (RPMs) due to maintenance issues, there is a need to identify other low cost ways to provide guidance to drivers in wet-night conditions; a "rumble stripe" is one such method. A "rumble stripe" can be painted on a shoulder rumble strip provided the rumble strip is located 4 to 8 inches from the edge line of the pavement. The "rumble stripe" is in addition to the existing edge line adjacent to the pavement.

The FHWA gave MDOT permission to study the use of double line edge lines for a period of four years, beginning in 2003. During the pilot study, approximately 200 shoulder miles were striped with the experimental double line edge lines on several freeway locations around the state. MDOT undertook three research projects during the study phase to determine the effectiveness of the pilot. The research findings indicate the pilot double line edge line project has proven beneficial. Wet night visibility and pavement marking durability can be provided at a low cost, without causing pavement joint damage, driver confusion or an undue amount of noise.

**ACTION:** The use of "rumble stripes" in addition to edge lines whenever a freeway or non-freeway rumble strip is located within 4 to 8 inches of the lane edge line is approved. The Traffic and Safety Division will incorporate details for proper installation into the pavement marking typical.

EOC accepts the report entitled *Painted Rumble Strips on Michigan Freeways: Driver and Community Perceptions*. EOC also approves permitting Public Sector Consultants, authors of the report, to post the information on their Web site.

## NEW BUSINESS

### **1. Sheeting on Temporary Signs – J. Grossklaus**

In 1997, MDOT began specifying prismatic sheeting in place of engineering grade sheeting for temporary signs on freeway and high-impact projects. The use of prismatic sheeting has since expanded to non-freeway projects due to the superior reflectivity and visibility over engineering grade sheeting. It is recommended that we expand the requirement for prismatic sheeting to all temporary signs used in construction zones. In order to minimize the impacts to industry, this will be accomplished over a three year period beginning with the October 2007 lettings, and will be effective on MDOT construction projects only. A plan will be developed to phase in the requirement to other operations.

**ACTION:** EOC approves the recommendation to phase in prismatic sheeting on all MDOT construction projects beginning with the October 2007 letting. Beginning with the October 2007 lettings, the University and Metro Regions will specify only prismatic sheeting. Beginning with the October 2008 lettings, the Grand, Southwest and Bay Regions will specify only prismatic sheeting. Beginning with the October 2010 lettings, the Superior and North Regions will specify only prismatic sheeting. There will be no mixing of sheeting types on any project before, during or after the transition period.

Begin discussions with various partners and stakeholders to establish implementation plans for the use of prismatic sheeting as follows:

- Rudy Cadena (Design Division) will meet with Mark Bott (Traffic and Safety Division) to coordinate a transition plan with CRAM and MML to implement the use of prismatic sheeting for local projects.
- Jon Reincke, Engineer of Maintenance, will begin discussions with CRAM to establish an implementation plan for all maintenance contract counties.
- John Polasek, Engineer of Development, will begin discussions with right-of-way permit stakeholders to establish an implementation plan for all trunkline permit work.

### **2. Left Turn Phasing Guidelines – P. Corlett**

The Traffic and Safety Division developed new guidelines to provide guidance and consistency for the use of left turn phasing on state trunklines. The new guidelines will help provide a better understanding for when to consider left turn phasing and what type of

phasing to implement when phasing is warranted. There are two types of left turn phasing currently in use in the State of Michigan; permissive/protected and protected only. The displays used during the permissive/protected operation include the flashing red ball, the green ball, or the flashing yellow arrow (a new display, which has been approved on an interim basis by the FHWA). The flashing yellow arrow has proven to have a higher level of comprehension than the flashing red ball. In addition, motorists who do not stop first for the flashing red ball before proceeding through the left turn are in violation of the Michigan Vehicle Code.

The Traffic Recommendation Committee recommends that the new left turn phasing guidelines be adopted for department use. It is also recommended that all new installations use the flashing yellow arrow as the display for the left turn phase.

**ACTION:** EOC approves the new Left Turn Phasing Guidelines, which will be incorporated into the Traffic and Safety Notes. EOC also approves the use of the flashing yellow arrow for left turn phasing on new installations. Paula Corlett, Traffic and Safety Division, will work with the Office of Communications to develop a communications plan regarding the new flashing yellow arrow.

### 3. MDOT Warranty Decision Tree – K. Kennedy

Warranties are used extensively on MDOT paving projects, including concrete and HMA paving, and capital preventative maintenance projects. There has been little flexibility in the decision to use or not use a warranty on a given project. As a result of partnering efforts between MDOT, FHWA, and the industry associations, new guidelines have been developed to aid in the warranty decision. A Warranty Decision Tree has been developed for use in the decision of whether to place a warranty in a particular project or not. The new guidelines take into account scoping, design, and construction issues associated with different fix types to ensure the right warranty is placed on the right project. It is recommended that the new MDOT Pavement Warranty Decision Tree be approved for use.

**ACTION:** EOC approves the MDOT Pavement Warranty Decision Tree, which will be incorporate in the *Warranty Guidelines Manual*.

### 4. Pavement Selections – B. Krom

#### a. US-31 Reconstruction, CS 64015, JN 75076

The reconstruction alternates considered were a hot mix asphalt (HMA) pavement (Alternate 1 – equivalent uniform annual cost [EUAC] \$29,481/directional mile) and a jointed plain concrete pavement (Alternate 2 - EUAC \$33,062/directional mile). A life cycle cost analysis was performed and Alternate 1 was approved based on having the lowest EUAC. The pavement design and cost analysis are as follows:

1.5” .....HMA, 5E10, Top Course (mainline & inside shoulder)

2"	HMA, 4E10, Leveling Course (mainline & inside shoulders)
3.5"	HMA, 3E10, Base Course (mainline)
2"	HMA, 4E10, Base Course (inside shoulder)
1.5"	HMA, 5E3, Top Course (outside shoulder)
2"	HMA, 4E3, Leveling Course (outside shoulder)
2"	HMA, 4E3, Base Course (outside shoulder)
2"	Aggregate Base, Modified (mainline)
3.5"	Aggregate Base, Modified (shoulder)
	Existing Aggregate Base & Sand Subbase
	Existing Underdrain System
9"	Total Section Thickness
Present Value Initial Construction Costs	\$401,348/directional mile
Present Value Initial User Costs	\$14,293/directional mile
Present Value Maintenance Costs	\$111,393/directional mile
Equivalent Uniform Annual Cost	\$29,481/directional mile

**b. M-10 Reconstruction, CS 82112, JN 75682**

The reconstruction alternates considered were an HMA pavement (Alternate 1 – EUAC \$318,960/directional mile) and a jointed plain concrete pavement (Alternate 2 - EUAC \$254,336/directional mile). A life cycle cost analysis was performed and Alternate 2 was approved based on having the lowest EUAC. The pavement design and cost analysis are as follows:

10"	Jointed Plain Concrete Pavement w/14' joint spacing (mainline & shoulders)
6"	Open Graded Drainage Course (mainline & shoulders)
	Geotextile Separator
10"	Sand Subbase
6" dia.	Open-Graded Underdrain System
26"	Total Thickness
Present Value Initial Construction Costs	\$922,051/directional mile
Present Value Initial User Costs	\$3,511,373/directional mile
Present Value Maintenance Costs	\$113,300/directional mile
Equivalent Uniform Annual Cost	\$254,336/directional mile

**5. MDOT's Official Plan Size – D. Belcher**

MDOT recently adopted the eProposal method for the plan delivery process. This includes the transition to fully electronic contract documents for the purpose of reviewing and bidding MDOT projects. The current practice requires both half and full size plans be created, published and stored in ProjectWise (the document management system for eProposal). This doubles the amount of server space required and increases the workload for personnel responsible for preparing plans for advertising. The 11 x 17 in. sheets can be easily scaled up to produce full size plan sheets if a user desires. In addition, printing of full size plan sheets

requires special printing equipment, while printing of 11 x 17 in. plan sheets can be accomplished on office printers.

It is recommended that the 11 x 17 in. plan sheet become the official MDOT plan size. If approved, only 11 x 17 in. plan sheets will be published in ProjectWise.

**ACTION:** EOC approves the recommendation to make 11 x 17 in. plan sheets the official MDOT plan size. The current CAD standards will be modified, as necessary. The Design Division will publish instructions for scaling the electronic 11 x 17 in. sheets to full size sheets, if the users desire to do so.

(Signed Copy on File at C&T)

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Brenda J. O'Brien, Secretary  
Engineering Operations Committee

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cc:	K. Steudle	S. Mortel	J. Steele (FHWA)
	J. Shinn	D. Jackson	R. Brenke (ACEC)
	L. Hank	W. Tansil	G. Bukoski (MITA)
	EOC Members	D. Wresinski	D. DeGraaf (MCPA)
	Region Engineers	C. Libiran	D. Hollingsworth (MCA)
	TSC Managers	R. J. Lippert, Jr.	J. Becsey (APAM)
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	T. Kratofil	T. Phillips	J. Murner (MRPA)
	M. DeLong	K. Peters	G. Naeyaert (ATSSA)
	B. Shreck	J. Ingle	C&T Staff